

# PATENT ABSTRACTS OF JAPAN

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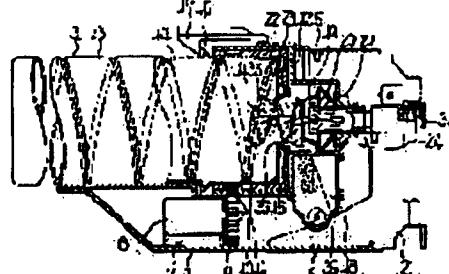
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## (54) TONER REPLENISHING DEVICE

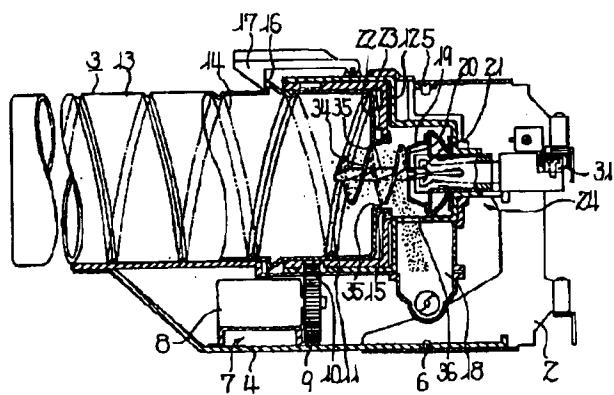
### (57)Abstract:

PURPOSE: To prevent the obstruction of the discharge of toner caused by the lump of half-solidified toner by attaching/removing a cap inside stopper to/from the toner discharge port of a toner housing container roughly horizontally held.

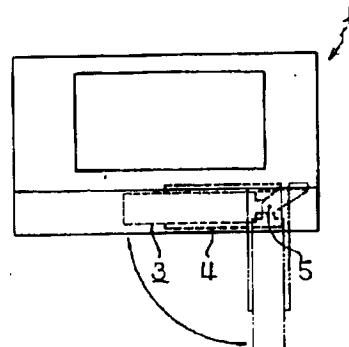
CONSTITUTION: A cap inside stopper attaching/removing means 24 attaching/ removing the cap inside stopper 19 to/from the toner discharge port 15 of the toner housing container 3 held by a movable bracket 4, in accordance with its turning operation and holding the cap inside stopper 19 removed from the toner discharge port 15 in a position near the toner discharge port 15 is provided on the movable bracket 4 for roughly horizontally holding the toner housing container 3. Then, a spiral screw body 34 projecting toward the inside of the toner housing container 3 in a direction opposite a projecting part 21 is fixed on the cover surface part 20 of the cap inside stopper 19 and formed in a length dimension for extending the screw body 34 to the inside of the toner discharge port 15, in a state where the cap inside stopper 19 is removed from the toner discharge port 15 by the cap inside stopper attaching/removing means 24.



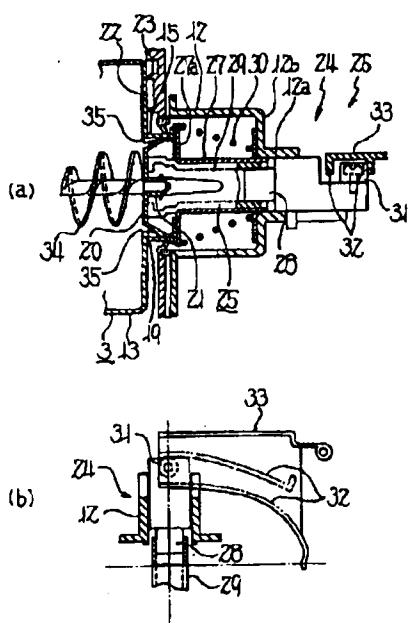
〔図1〕



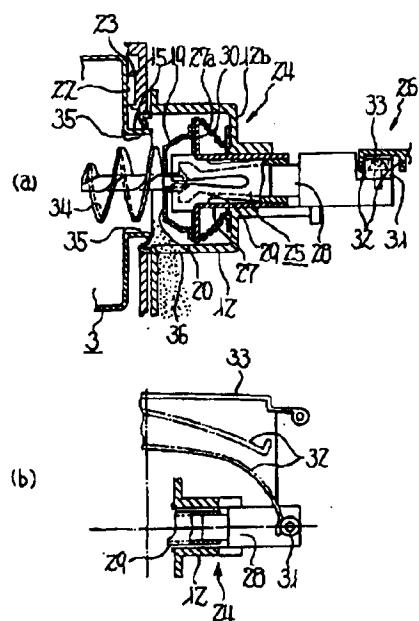
〔図2〕



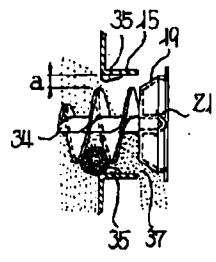
( 3)



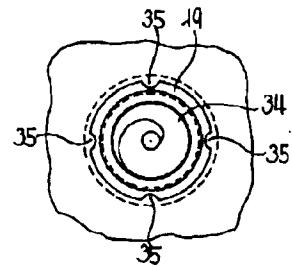
[图4]



【図5】



【図6】



**\* NOTICES \***

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1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

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**DETAILED DESCRIPTION**

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**[Detailed Description of the Invention]****[0001]**

[Industrial Application] By carrying out revolution actuation to shaft orientations, this invention makes an internal toner breathe out from a toner delivery, and relates to the toner makeup equipment which was made to supply the toner to the development section while it attaches a toner stowage container in image formation equipments, such as a copying machine and facsimile, at the abbreviation level sense.

**[0002]**

[Description of the Prior Art] There is a thing of various formats in the toner makeup equipment using a bottle-like toner stowage container conventionally. The toner stowage container which formed the toner delivery in the end side of this body of a container while forming the spiral projection in the inner skin of the tubed body of a container into image formation equipment to the abbreviation level sense. For example, anchoring, occasion, There are some which supplied the toner which was made to breathe out from a toner delivery while conveying the internal toner to the toner delivery side by spiral projection by rotating a toner stowage container to the shaft orientations, and was breathed out to the development section.

**[0003]**

[Problem(s) to be Solved by the Invention] Here, the cap is attached in the toner delivery free [ attachment and detachment ], and the toner stowage container which removed the cap and made the toner delivery the open condition is attached into image formation equipment. For this reason, in case the time of attaching a toner stowage container into image formation equipment and a toner stowage container are demounted from the inside of image formation equipment, there is a danger that a toner will begin to fall from the toner delivery which is in the open condition. In case a toner stowage container is demounted especially, in order for an impact to join a toner stowage container, the toner which remains inside falls and it is easy to generate \*\*\*\*.

[0004] Moreover, if image formation equipment is not used over a long period of time, or the lump of the toner half-solidified in the toner stowage container when operating frequency was low may be made and such a lump is made, the dischargeability of the toner from a toner delivery will worsen.

**[0005]**

[Means for Solving the Problem] The toner stowage container with which invention according to claim 1 formed the toner delivery in the end side center section of the tubed body of a container, A maintenance means to hold this toner stowage container to the abbreviation level sense in the condition of having made the toner induction to the development section open for free passage, In the toner makeup equipment which has the revolution driving means which rotates said toner stowage container held at this maintenance means to those shaft orientations The plug in a cap is attached in said toner delivery free [ attachment and detachment ]. A plug desorption means in a cap to hold the plug in said cap demounted while carrying out desorption of the plug in said cap to said toner delivery of said toner stowage container held by said maintenance means in the location close to said toner delivery is established. The screw object which extended into said toner delivery to the plug in said cap was

established.

[0006] In invention according to claim 1, invention according to claim 2 formed said screw object in the sense conveyed in the direction which makes the toner in this toner stowage container breathe out from said toner delivery with a revolution of a toner stowage container while setting up small spacing of a screw object and the inner skin of a toner delivery.

[0007] Invention according to claim 3 formed two or more heights or crevices in the inner skin of a toner delivery in invention according to claim 1 or 2.

[0008]

[Function] In invention according to claim 1, desorption of the plug in a cap is carried out by the plug desorption means in a cap to the toner delivery of the toner stowage container held by the maintenance means at the abbreviation level sense. For this reason, when making a toner stowage container hold to a maintenance means or demounting it from a maintenance means, it will be in the condition that the plug in a cap was attached in the toner delivery, and it will be prevented that a toner begins to fall from a toner delivery. And after the plug in a cap is demounted, when revolution actuation of the toner stowage container is carried out by the revolution driving means, the toner in a toner stowage container is breathed out from a toner delivery, and is supplied to the development section from toner induction. Moreover, since the screw object prepared in the plug in a cap held in the location close to a toner delivery has extended into a toner delivery while demounting from a toner delivery with the plug desorption means in a cap, Even if the lump of the toner half-solidified in the toner stowage container arises, in case that lump passes through a toner delivery, he is crushed with the screw object which rotates relatively to this toner delivery, and the regurgitation of the toner from a toner delivery is performed smoothly.

[0009] In invention according to claim 2, the lump of a toner which passes through a toner delivery is crushed still more finely by setting up small spacing of a screw object and the inner skin of a toner delivery. Moreover, since the screw object is formed in the sense conveyed in the direction which makes the toner in a toner stowage container breathe out from a toner delivery with a revolution of a toner stowage container, even if spacing of a screw object and the inner skin of a toner delivery is small, the regurgitation of the toner from a toner delivery is performed smoothly.

[0010] In invention according to claim 3, crushing of the lump of a toner with the screw object which the lump of the half-solidified toner which entered the toner delivery will be in the condition of having been temporarily held by the heights or the crevice formed in the inner skin of a toner delivery, therefore rotates relatively to a toner delivery is promoted.

[0011]

[Example] One example of this invention is explained based on a drawing. First, drawing 2 is the top view having simplified and shown the whole plain paper copier structure, and drawing 1 shows the structure of the toner makeup unit in that of the plain paper copier. The fixed bracket 2 is being fixed to said plain paper copier 1, and the hinged cantilever 4 which is a maintenance means for holding the toner stowage container 3 which contained the toner to the abbreviation level sense is attached in this fixed bracket 2 free [ rotation ] in the level surface by using the pins 5 and 6 of a vertical couple as the supporting point. Moreover, the revolution driving means 7 which makes those shaft orientations rotate said toner stowage container 3 held at the abbreviation level sense is attached in said hinged cantilever 4, and this revolution driving means 7 is formed of the tubed revolution transfer member 11 in which the head side of said toner stowage container 3 is inserted while the last gear of the gear group 9 and the gear group 9 by which revolution actuation is carried out by the motor 8 and the motor 8, and the gearing gear 10 are formed. In addition, said tubed revolution transfer member 11 is held free [ a revolution in the toner stowage container stopper 12 held fixed at said hinged cantilever 4 ].

[0012] The spiral projection 14 spirally wound around the inner skin of the body 13 of a container of the shape of a cylinder in said toner stowage container 3 is formed, and the toner delivery 15 where a toner is breathed out is formed in the head side center section of the body 13 of a container. In addition, said spiral projection 14 is formed in the sense which turns an internal toner to the toner delivery 15 side, and conveys it in connection with said toner stowage container 3 rotating to the shaft orientations. Moreover,

the ring-like projection [ engagement ] 16 is formed in the periphery section of the side in which said toner delivery 15 in said body 13 of a container was formed, and the engagement pawl 17 which regulates removal of said toner stowage container 3 held at said hinged cantilever 4 is attached in said toner stowage container stopper 12 by engaging with this engagement projection 16. Moreover, the toner induction 18 for supplying the toner breathed out from said toner delivery 15 to the development section (not shown) is formed in said hinged cantilever 4. In addition, the plug 19 in a cap is attached in said toner delivery 15 free [ attachment and detachment ], and the height 21 which projected towards the method of outside from the top surface section 20 is formed in the plug 19 in this cap.

[0013] The engagement heights 22 are formed in the head side in which said toner delivery 15 in said body 13 of a container was formed. The engagement crevice 23 which carries out revolution transfer from this tubed revolution transfer member 11 to the toner stowage container 3 by engaging with the inner skin of said tubed revolution transfer member 11 with said engagement heights 22 is formed. While making the toner stowage container 3 hold to hinged cantilever 4, when the head side of the toner stowage container 3 is inserted in the tubed revolution transfer member 11, the engagement heights 22 and the engagement crevice 23 are engaged.

[0014] While carrying out desorption of the plug 19 in said cap to said hinged cantilever 4 next to said toner delivery 15 of said toner stowage container 3 held with rotation actuation of said hinged cantilever 4 at this hinged cantilever 4, a plug desorption means 24 in a cap to hold the plug 19 in a cap removed from the toner delivery 15 in the location close to the toner delivery 15 is established. In addition, this plug desorption means 24 in a cap is formed of the collet chuck 25 which gathers or detaches said height 21, and the cam mechanism 26 which makes said toner delivery 15 open and close by moving the plug 19 in a cap which had the height 21 gathered by the collet chuck 25 to an unstopping location and a closing location with a collet chuck 25.

[0015] Here, said collet chuck 25 is formed of the tubed core 27 held free [ the slide to boss section 12a of said toner stowage container stopper 12 ], the shaft 28 fitting of the slide of into a core 27 was made free, and the knob section 29 which has the flexibility fixed to the head side of a shaft 28. Moreover, the conical spring 30 which said cam mechanism 26 is infix between step 12b of said toner stowage container stopper 12, and flange 27a of said core 27, and energizes a core 27 to the toner stowage container 3 side. The koro 31 attached in the back end side of said shaft 28, When rotating said pins 5 and 6 for said hinged cantilever 4 as the supporting point, while the guide cam section 32 which guides said koro 31 is formed, it is formed by the bracket hinge 33 fixed to said fixed bracket 2.

[0016] Next, the spiral screw object 34 which projected towards the way is being fixed to the reverse sense by said top surface section 20 of the plug 19 in said cap among said toner stowage containers 3 in said height 21, and this screw object 34 is formed in the linear dimension which extends in the toner delivery 15 in the condition of having demounted the plug 19 in a cap from the toner delivery 15 with said plug desorption means 24 in a cap. Moreover, the spacing a of this screw object 34 and the inner skin of the toner delivery 15 is set as the small dimension (1-6mm), and this screw object 34 is further formed in the sense conveyed in the direction which makes the toner in the toner stowage container 3 breathe out from the toner delivery 15 with a revolution of said toner stowage container 3. In addition, the axial center of the toner stowage container 3 and two or more heights 35 which extended to parallel are formed in the inner skin of said toner delivery 15.

[0017] In such a configuration, the procedure of attaching the toner stowage container 3 in a plain paper copier 1 is explained first. The location (attachment-and-detachment location of the toner stowage container 3) shown with the two-dot chain line in drawing 2 by using pins 5 and 6 as the supporting point is made to rotate hinged cantilever 4, while inserting the head side in which the toner delivery 15 in the toner stowage container 3 is formed into the toner stowage container stopper 12, the toner stowage container 3 is held with hinged cantilever 4, and the engagement pawl 17 is made to engage with the engagement projection 16. Here, in the toner stowage container stopper 12, the tubed revolution transfer member 11 is held free [ a revolution ], and the engagement heights 22 of the toner stowage container 3 engage with the engagement crevice 23 of the tubed revolution transfer member 11 by inserting the head side of the toner stowage container 3 into the toner stowage container stopper 12. In addition, in case the

toner stowage container 3 is held with hinged cantilever 4, the plug 19 in a cap is performed in the state of a mounting beam, and as the height 21 of the plug 19 in a cap showed drawing 3 (a), while entering between the knob sections 29 of a collet chuck 25, the plug 19 in a cap is maintained by the closing condition.

[0018] Subsequently, hinged cantilever 4 is rotated to the location (toner makeup location) shown with the broken line in drawing 2 by using pins 5 and 6 as the supporting point. Then, the koro 31 moves to the location shown in drawing 4 (b) from the location shown in drawing 3 (b) along with the guide cam section 32 with this rotation actuation, and a collet chuck 25 slides to the location shown in drawing 4 (a) from the location shown in drawing 3 (a) simultaneously. Here, it gathers, when it gathers with the shaft 28 which is a part of collet chuck 25 and the section 29 slides slightly towards the location of drawing 4 (a), and the periphery section of the section 29 bends inside in contact with a core 27, and the knob section 29 gathers the height 21 of the plug 19 in a cap. And when it gathers with a shaft 28 successively and the section 29 slides towards the location of drawing 4 (a). Also slide in one the plug 19 in a cap which gathered with the core 27 and was gathered by the section 29, and it compresses a conical spring 30. Soon, as shown in drawing 4 (a), the plug 19 in a cap moves to an unstopping location, the toner delivery 15 is opened, the toner stowage container 3 is opened for free passage by the toner induction 18 through the toner delivery 15, and anchoring of the toner stowage container 3 is completed. Therefore, in case the toner stowage container 3 is attached into a plain paper copier 1, while not unstopping the plug 19 in a cap beforehand, and the toner from the toner delivery 15 falling and preventing \*\*\*\*\*, soiling an operator's hand, clothing, and hinged cantilever 4 with the toner which began to fall is prevented. In addition, the plug 19 in a cap demounted from the toner delivery 15 is held in the location close to the toner delivery 15, as shown in drawing 4 (a).

[0019] Next, after anchoring of the toner stowage container 3 is completed, it will copy, but if a sensor (not shown) detects that the toner in the toner induction 18 is below the specified quantity, a motor 8 will drive based on the detection result. And revolution actuation of the tubed revolution transfer member 11 is carried out by actuation of a motor 8 through the gear group 9 and a gear 10, and revolution actuation of the toner stowage container 3 is carried out in one with the tubed revolution transfer member 11 by engagement to the engagement heights 22 and the engagement crevice 23 at the shaft orientations. If the toner stowage container 3 rotates to the shaft orientations, the spiral projection 14 shows around, and the toner in the toner stowage container 3 will be conveyed gradually, and will be soon breathed out from the toner delivery 15 to the toner delivery 15 side. The toner breathed out from the toner delivery 15 passes the opening 36 for toner drop formed in the toner stowage container stopper 12, is supplied to the toner induction 18, and is further supplied to the development section.

[0020] Here, in the condition of having demounted the plug 19 in a cap from the toner delivery 15 with the plug desorption means 24 in a cap, as shown in drawing 1, drawing 4 (a), and drawing 5, the screw object 34 has extended into the toner delivery 15. For this reason, if the lump of the half-solidified toner which was produced within the toner stowage container 3 enters in the toner delivery 15 by conveyance by the spiral projection 14 accompanying a revolution of the toner stowage container 3, in this lump, it will be temporarily held by heights 35, and he will be sandwiched by the screw object 34 and heights 35 which rotate relatively to the inner skin of the toner delivery 15, and will be crushed. For this reason, getting the lump of the half-solidified toner blocked in the clearance section 37 between the plug 19 in a cap and the toner delivery 15, and barring the regurgitation of the toner from the toner delivery 15 is prevented. And since the screw object 34 is formed in the sense conveyed in the direction which makes the toner in the toner stowage container 3 breathe out from the toner delivery 15 with a revolution of the toner stowage container 3, even if spacing of the screw object 34 and the inner skin of the toner delivery 15 is small, the regurgitation of the toner from the toner delivery 15 is performed smoothly.

[0021] Next, when a toner is lost in the toner stowage container 3, hinged cantilever 4 is rotated to the attachment-and-detachment location of the toner stowage container 3 shown with the two-dot chain line in drawing 2 by using pins 5 and 6 as the supporting point. Then, with this rotation actuation, it moves to the location which met the guide cam section 32 from the location which the koro 31 showed to drawing 4 (b), and was shown in drawing 3 (b), it gathers with a shaft 28 simultaneously, and the section 29

slides towards the location shown in drawing 3 (a) from the location shown in drawing 4 (a) with the plug 19 in a cap. At this time, it slides in [ the core 27 energized by the conical spring 30 ] one, and soon, as shown in drawing 3 (a), when the plug 19 in a cap slides to a closing location, the closedown of the toner delivery 15 is carried out. Moreover, since the dimension is set up so that flange 27a of a core 27 may gather with a shaft 28 also after a slide is regulated in contact with the point of the toner delivery 15, and the section 29 may slide slightly, it gathers, when it gathers immediately after flange 27a contacts to the point of the toner delivery 15, and the section 29 bends to the method of outside, and the knob condition of the height 21 by the section 29 is canceled. Therefore, in case the toner stowage container 3 whose toner was lost is demounted from hinged cantilever 4, it is prevented that it continues being in the condition that the toner delivery 15 was opened. For this reason, in case the toner stowage container 3 is demounted, it is lost that the toner which remains slightly in the toner stowage container 3 begins to fall outside, and soiling an operator's hand, clothing, and hinged cantilever 4 with the toner which began to fall is prevented.

[0022] In addition, in this example, although the toner stowage container 3 which formed the spiral projection 14 in the inner skin of the body 13 of a container was mentioned as the example and explained, this spiral projection 14 is not necessarily required, and is good also considering the inner skin of the body of a container as a smooth side. And conveyance of the toner accompanying a revolution is performed like the case where the spiral projection 14 is formed, and abbreviation, by considering as the cylinder object of the configuration which turns the body of a container to the toner delivery 15 side, and extends it gradually, or making the body of a container incline slightly and attaching it so that the toner delivery 15 may serve as the bottom when inner skin of the body of a container is made into a smooth side.

[0023] Moreover, in this example, although what formed heights 35 in the inner skin of the toner delivery 15 was mentioned as the example and explained, it may replace with these heights 35 and the axial center of the toner stowage container 3 and two or more crevices which extended to parallel may be formed.

[0024] [Effect of the Invention] The toner stowage container with which invention according to claim 1 formed the toner delivery in the end side center section of the tubed body of a container as mentioned above, A maintenance means to hold this toner stowage container to the abbreviation level sense in the condition of having made the toner induction to the development section open for free passage, In the toner makeup equipment which has the revolution driving means which rotates said toner stowage container held at this maintenance means to those shaft orientations The plug in a cap is attached in said toner delivery free [ attachment and detachment ]. Since a plug desorption means in a cap to hold the plug in said cap demounted while carrying out desorption of the plug in said cap to said toner delivery of said toner stowage container held by said maintenance means in the location close to said toner delivery was established It can prevent that a toner begins to fall from a toner delivery since it will be in the condition that the plug in a cap was attached in the toner delivery when making a toner stowage container hold to a maintenance means or demounting it from a maintenance means. Therefore, since the screw object which could prevent soiling an operator's hand, clothing, and maintenance means with the toner which began to fall, and extended into said toner delivery to the plug in said cap was established Even if the lump of the toner half-solidified in the toner stowage container arises, that lump can be crushed with the screw object which rotates relatively to this toner delivery in case this lump passes through a toner delivery. Therefore, it prevents that the regurgitation of a toner is barred with the lump of the half-solidified toner, and has effectiveness -- the regurgitation of the toner from a toner delivery can be made to perform smoothly etc..

[0025] Invention according to claim 2 is set to invention according to claim 1 as mentioned above. Since said screw object was formed in the sense conveyed in the direction which makes the toner in this toner stowage container breathe out from said toner delivery with a revolution of a toner stowage container while setting up small spacing of a screw object and the inner skin of a toner delivery The lump of a toner which passes through a toner delivery can be crushed still more finely. And since the screw object

is formed in the sense conveyed in the direction which makes the toner in a toner stowage container breathe out from a toner delivery with a revolution of a toner stowage container. Even if spacing of a screw object and the inner skin of a toner delivery is small, it has effectiveness -- the regurgitation of the toner from a toner delivery can be made to perform smoothly etc..

[0026] As mentioned above, it has the effectiveness of being able to promote crushing of the lump of a toner in order to crush the lump of the toner held while holding temporarily the lump of the half-solidified toner which entered the toner delivery by heights or the crevice with a screw object, since invention according to claim 3 formed two or more heights or crevices in the inner skin of a toner delivery in invention according to claim 1 or 2.

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[Translation done.]